

Claims

What is claimed is:

1. An automated system for emptying contents of
pharmaceutical containers including medications,
5 comprising:

a gripper unit for receiving and holding a
pharmaceutical container;

a cutter for cutting the pharmaceutical container;

10 a rotating unit operable with said gripper unit that
rotates at least a portion of said gripper unit to
empty the contents of the pharmaceutical container.

2. The system according to claim 1, further comprising
a robot for placing the pharmaceutical container in said
15 gripper unit.

3. The system according to claim 2, further comprising
a conveyor for transporting the pharmaceutical container
in proximity to said robot.

20 4. The system according to claim 3, further comprising
a vision system utilized by said robot to determine the
position of the pharmaceutical container on said
conveyor.

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5. The system according to claim 4, wherein when said vision system does not recognize at least one of the size and shape of a pharmaceutical container, the pharmaceutical container is transported off said conveyor.

6. The system according to claim 5, wherein the bottles transported off of said conveyor are deposited in a bin.

7. The system according to claim 1, wherein the contents of the pharmaceutical container are emptied into a bulk-up container.

8. The system according to claim 7, wherein the bulk-up container comprises a substantially uniform sized container to facilitate the automated dispensing of the medications.

9. The system according to claim 1, wherein said cutter is an ultrasonic cutter.

10. The system according to claim 3, wherein said cutter comprises a blade that moves in a direction substantially parallel to a belt of said conveyor.

11. The system according to claim 10, wherein a rodless air cylinder is used to facilitate movement of said cutter.

5 12. The system according to 1, further comprising an arm that rotates to a first position to receive the cut portion of the pharmaceutical container, and a second position to place the cut portion in a waste repository.

10 13. The system according to 12, wherein said arm utilizes a vacuum that retains the cut portion of said pharmaceutical bottle when said arm is in the first position, and the vacuum decreases when said arm is in the second position to effect release of the cut portion.

15 14. The system according to claim 13, where the cut portion is released in a scrap bin.

20 15. The system according to claim 1, further comprising a scrap chute that receives a portion of the pharmaceutical container subsequent to emptying the contents of the pharmaceutical container.

16. The system according to claim 15, wherein said
scrap chute is in a distal position with respect to said
gripper unit prior to emptying the contents of the
pharmaceutical container, said scrap chute moving to a
5 proximal position with respect to said gripper unit to
receive the portion of the pharmaceutical container held
by the gripper unit subsequent to emptying the contents
of the pharmaceutical container, said scrap chute
returning to said distal position to place the portion of
10 the pharmaceutical container held by said gripper unit in
a scrap bin.

17. The system according to claim 1, further comprising
a sensor system to determine when the contents of the
15 pharmaceutical container are no longer being emptied.

18. The system according to claim 17, wherein said
sensor system comprises a light emitter and a light
receiver, said light emitter providing a light beam that
20 is broken by the contents of the pharmaceutical container
when the contents of the pharmaceutical container are
being emptied.

19. The system according to claim 1, wherein said
25 gripper unit comprises first and second interlocking
fingers.

20. The system according to claim 21, wherein said first and second interlocking fingers are substantially V-shaped.

5 21. The system according to claim 19, further comprising a detection system to detect when the pharmaceutical container is no longer being held by said gripper unit.

10 22. The system according to claim 21, wherein said detection system comprises a light beam source and reflector, said reflector not sensing the light from said light beam source when the pharmaceutical container is held by said gripper unit.

15 23. The system according to claim 21, wherein the pharmaceutical container can be of different shapes and sizes.

20 24. An method for emptying the contents of pharmaceutical containers, including medications, comprising the steps of:
 holding a pharmaceutical container for cutting;
 cutting the pharmaceutical container; and
25 rotating the pharmaceutical container to empty the contents of the pharmaceutical container.

25. The method according to 24, further comprising the step of placing the pharmaceutical container in a waste repository subsequent to cutting.

5 26. The method according to 25, further comprising the step of electronically viewing the pharmaceutical container prior to said holding and cutting steps.

10 27. The method according to claim 26, wherein said viewing step provides a position information of said pharmaceutical container.

15 28. The method according to claim 24, further comprising the step of detecting when the contents of the pharmaceutical container are no longer being emptied.

20 29. The method according to claim 24, further comprising the step of detecting when the pharmaceutical container is no longer being held.

30. An automated system for emptying the contents of pharmaceutical containers, comprising:

means for receiving and holding a pharmaceutical container;

5 means for cutting the pharmaceutical container;

means for rotating at least a portion of said means for receiving and holding to empty the contents of the pharmaceutical container.

10 31. The system according to claim 30, further comprising means for placing the pharmaceutical container in said means for receiving and holding.

15 32. The system according to claim 31 further comprising means for transporting the pharmaceutical containers in proximity to said means for receiving and holding.

20 33. The system according to claim 32, further comprising a means for viewing and determining the position of the pharmaceutical containers on said means for transporting.

25 34. The system according to 30, further comprising an arm that rotates to a first position to receive the cut portion of the pharmaceutical container, and a second position to place the cut portion in a waste repository.

35. The system according to claim 30, further comprising means for determining when the contents of the pharmaceutical container are no longer being emptied.

5 36. The system according to claim 30, further comprising means for detecting when the pharmaceutical container is no longer being held by said means for receiving and holding.

10 37. An automated system for emptying the contents of pharmaceutical containers, including medications, comprising:

 a gripper unit for receiving and holding a pharmaceutical container;

15 a cutter for cutting the pharmaceutical container; and
 a control system for controlling the operation of said gripper unit and said cutter.

20 38. The system according to claim 37, further comprising a rotating unit, operable with said gripper and said control system, that rotates at least a portion of said gripper unit to empty the contents of the pharmaceutical container.

25 39. The system according to claim 37, wherein said control system comprises a keyboard, control logic, a display, and a processing unit.

40. The system according to claim 39, further comprising an indicia reader that interfaces with said control system.

5 41. The system according to claim 40, wherein an indicia associated with a pharmaceutical container is read by said indicia reader, and said control system determining whether said pharmaceuticals are authorized.

10 42. The system according to claim 39, wherein said control system receives identification information of an operator of the system.

15 43. The system according to claim 37, further comprising a robot, interfacing with said control system, for placing the pharmaceutical container in said gripper unit.

20 44. The system according to claim 43, further comprising a vision system, utilized by said robot and interfacing with said control system, to determine the position of the pharmaceutical containers.

25 45. The system according to claim 37, wherein the contents of the pharmaceutical container are emptied into a bulk-up container.

46. The system according to claim 37, further comprising a rodless air cylinder that is used to facilitate movement of said cutter.

5. 47. The system according to 37, further comprising an arm, interfacing with said control system, that rotates to a first position to receive a cut portion of the pharmaceutical container, and a second position to place the cut portion in a waste repository.

10 48. The system according to 47, wherein said arm utilizes a vacuum that retains the cut portion of said pharmaceutical bottle when said arm is in the first position, and the vacuum is reduced when said arm is in
15 the second position to effect release of the cut portion.

49. The system according to claim 37, further comprising a scrap chute, controlled by said control system, that receives a portion of the pharmaceutical
20 container subsequent to emptying the contents of the pharmaceutical container.

50. The system according to claim 37, further comprising a sensor system, interfacing with said control
25 system, to determine when the contents of the pharmaceutical container are no longer being emptied.

51. The system according to claim 37, further comprising a detection system, interfacing with said control system, to detect when the pharmaceutical container is no longer being held by said gripper unit.

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52. A prescription filling and packing system comprising:

a gripper unit for receiving and holding a pharmaceutical container;

10 a cutter for cutting the pharmaceutical container;

a rotating unit operable with said gripper unit that rotates at least a portion of said gripper unit to empty the contents of the pharmaceutical container into a storage container; and

15 at least one dispensing machine that automatically counts and dispenses pharmaceuticals from the storage container and into bottles in accordance with prescription orders comprising at least one prescription.

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53. The system according to 52, further comprising at least one printer for printing literature packs customized to the prescription orders.

54. The system according to 52, further comprising at least one order consolidation and packing (OCP) station that presents a shipping container for each prescription order and inserts at least one bottle for each
5 prescription order into the shipping container and inserts a corresponding literature pack for each prescription order into the shipping container.

55. A prescription dispensing and packing system
10 comprising:

- a gripper unit for receiving and holding a pharmaceutical container;
- a cutter for cutting the pharmaceutical container;
- a rotating unit operable with said gripper unit that
15 rotates at least a portion of said gripper unit to empty the contents of the pharmaceutical container into a storage container;
- a plurality of carriers, each having receptacles to receive a plurality of bottles in scheduled
20 locations; and
- at least one dispensing machine that counts and simultaneously dispenses pharmaceuticals from the pharmaceutical container and into at least one of the plurality of bottles.

56. The system according to claim 55, further comprising a computer that receives prescription orders comprising at least one prescription.

5 57. The system according to claim 55, further comprising a loading station that loads the plurality of bottles in the scheduled locations corresponding to the prescription orders in at least one of said plurality of carriers.

10 58. The system according to claim 55, further comprising at least one transport device that transports said plurality of carriers with the plurality of bottles through said at least one dispensing machine.

15 59. The system according to claim 55, further comprising at least one order consolidation and packing (OCP) station that receives said plurality of carriers from said at least one dispensing machine and presents
20 shipping containers to be filled, said at least one OCP station unloading the plurality of bottles from said plurality of carriers and loading at least one of the plurality of bottles and a corresponding customized literature pack corresponding to a prescription order
25 into a shipping container, the literature pack and each of the bottles having at least one corresponding identifier identified by at least one identification

system to ensure that each of one or more bottles associated with the corresponding prescription order are inserted into the shipping container with the corresponding literature pack.

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60. In an automated system for emptying contents of pharmaceutical containers including medications, comprising a gripper unit for receiving and holding a pharmaceutical container, a cutter for cutting the pharmaceutical container, and a rotating unit operable with the gripper unit that rotates at least a portion of the gripper unit to empty the contents of the pharmaceutical container, a method for emptying the contents of pharmaceutical containers, including medications, comprising the steps of:

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holding a pharmaceutical container for cutting;
cutting the pharmaceutical container; and
rotating the pharmaceutical container to empty the contents of the pharmaceutical container.

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61. The method according to 60, further comprising the step of placing the pharmaceutical container in a waste repository subsequent to cutting.

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62. The method according to 61, further comprising the step of electronically viewing the pharmaceutical container prior to said holding and cutting steps.

63. The method according to claim 62, wherein said viewing step provides a position information of said pharmaceutical container.

5 64. The method according to claim 60, further comprising the step of detecting when the contents of the pharmaceutical container are no longer being emptied.

10 65. The method according to claim 60, further comprising the step of detecting when the pharmaceutical container is no longer being held.

66. In an automated system for emptying the contents of pharmaceutical containers, including medications, comprising a gripper unit for receiving and holding a pharmaceutical container, a cutter for cutting the pharmaceutical container, a control system for controlling the operation of the gripper unit and the cutter, and a rotating unit, operable with the gripper and the control system, that rotates at least a portion of the gripper unit to empty the contents of the pharmaceutical container, a method for emptying the contents of pharmaceutical containers, including medications, comprising the steps of:

holding the pharmaceutical container for cutting;

cutting the pharmaceutical container; and

rotating the pharmaceutical container to empty the contents of the pharmaceutical container.

67. The method according to 66, further comprising the step of placing the pharmaceutical container in a waste repository subsequent to cutting.

68. The method according to 67, further comprising the step of electronically viewing the pharmaceutical container prior to said holding and cutting steps.

69. The method according to claim 68, wherein said viewing step provides a position information of the pharmaceutical container.

5 70. The method according to claim 66, further comprising the step of detecting when the contents of the pharmaceutical container are no longer being emptied.

10 71. The method according to claim 66, further comprising the step of detecting when the pharmaceutical container is no longer being held.